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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/845,405	04/30/2001	Gerhard Beitel	GR 00 P 4091	2869
24131	7590	04/07/2004	EXAMINER	
LERNER AND GREENBERG, PA P O BOX 2480 HOLLYWOOD, FL 33022-2480			VINH, LAN	
			ART UNIT	PAPER NUMBER
			1765	

DATE MAILED: 04/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

AC

Office Action Summary	Application No. 09/845,405	Applicant(s) BEITEL ET AL.	
	Examiner Lan Vinh	Art Unit 1765	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 March 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 4-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 8-12 is/are allowed.
- 6) ☒ Claim(s) 1 and 4-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 09/845,405.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

2. Claims 1, 4, 5, 7 are rejected under 35 U.S.C. 102(e) as being anticipated by Van Buskirk et al (US 6,346,741)

Van Buskirk discloses a method for forming an integrated circuit. This method comprises the steps of:

providing a substrate (fig. 1D)

forming the structured electrode layers 30 and 34 of a noble metal (Pt) on the substrate, (col 14, lines 9-17), the structured layers 30 and 34 are to be removed in a polishing step (fig. 1E), fig. 1D of Van Buskirk shows that the structured electrode layers 30 and 34 having the width of greater than twice the thickness/length of the layers, which reads on forming the structures on the substrate with an aspect ratio of greater than 2

forming/depositing an dielectric layer 35 (silicon oxide) on the structured layers 30, 34 and the substrate (col 13, lines 55-56, col 14, lines 9-11 ; fig. 1D), the dielectric

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layer 35 is removed in a polishing step (fig. 1E), which reads on depositing a sacrificial layer on the structure to be removed and the substrate

performing a CMP process to planarize and remove the structured layers 30, 34/structures to be removed and the dielectric layer 35/sacrificial layer (col 14, lines 48-50, fig. 1E)

The limitations of claims 4, 5 have been discussed above

Regarding claim 7, fig. 1D of Van Buskirk also shows that the structured electrode layers 30 and 34 having a width much greater than the thickness of the layers, which reads on forming the structures on the substrate with an aspect ratio of greater than 4

3. Claims 1, 4, 5, 7 are rejected under 35 U.S.C. 102(e) as being anticipated by Choi (US 6,030,866)

Choi discloses a method for manufacturing a capacitor. This method comprises the steps of:

providing a substrate (fig. 3D)

forming the structured electrode layers 67 of a noble metal (Pd) on the substrate, (col 4, lines 46-48), the structured layers 67 are removed in a polishing step (fig. 3E), fig. 3D of Choi shows that the structured electrode layers 67 having the width of greater than twice the thickness of the layers, which reads on forming the structures on the substrate with an aspect ratio of greater than 2

forming/depositing an dielectric layer 69 (silicon oxide) on the structured layers 67 and the substrate (col 4, lines 54-55 ; fig. 3D), the dielectric layer 69 is removed in a

polishing step (fig. 3E), which reads on depositing a sacrificial layer on the structure to be removed and the substrate

performing a CMP process to polish and remove the structured layers 67/structures to be removed and the dielectric layer 69/sacrificial layer (col 4, lines 56-58, fig. 3E)

The limitations of claims 4, 5 have been discussed above

Regarding claim 7, fig. 3D of Choi also shows that the structured electrode layers 30 and 34 having a width much greater than the thickness of the layers, which reads on forming the structures on the substrate with an aspect ratio of greater than 4

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Van Buskirk et al (US 6,346,741) in view of Ismail et al (US 5,955,759)

Van Buskirk's method has been described above in paragraph 2. Unlike the instant claimed inventions as per claim 6, Van Buskirk fails to disclose the step of removing residue of the sacrificial layer by wet processes followed the CMP.

However, Ismail discloses a method for manufacturing a semiconductor device using CMP comprises the step of removing the remaining sacrificial layer 1 by wet etching (col 3, line 48-49)

Hence, one skilled in the art would have found it obvious to modify Van Buskirk's method by adding the step of removing the remaining sacrificial layer 1 by wet etching as per Ismail after the CMP step because Ismail teaches that sacrificial layer is preferably removed by wet etching to avoid reactive ion etching damage to the semiconductor structure (col 3, lines 49-50)

Allowable Subject Matter

6. Claims 8-12 are allowed.

The following is an examiner's statement of reasons for allowance:

Regarding claim 8, the cited prior arts of record fail to disclose the step of performing a polishing step to remove the redepositions of the layer (redeposition that emerge at the sidewalls of the mask) being structured so that a structured layer emerges. Since the closest cited prior art of Chien et al (US 5,702,869) discloses that all the surrounding (conductive interconnection stud) of Chien's redepositions 27a on the sidewall of a mask 26a are of fundamental importance to Chien device's operativeness, thus performing a polishing step to remove the redepositions in Chien would have removed the surrounding of Chien's redeposition and rendered Chien's device inoperable.

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Hsieh et al (US 5,874,764) discloses that a aspect ratio is a ratio of width to length (col 1, lines 10-30)

Response to Arguments

8. Applicant's arguments filed 3/10/2004 have been fully considered but they are not persuasive.

The applicants argue that the structures to be removed in either Van Buskirk or Choi do not and can not have an aspect ratio of greater than 2 because the structures to be removed/portions in both Van Buskirk and Choi are the horizontal oriented layer portions and consequently have an aspect ratio of smaller than 1. This argument is unpersuasive for the following reasons. Although, the examiner recognizes that in both references those portions to be removed are horizontally oriented layer portions, however, since the instant specification does not provide a guideline of how to define an aspect ratio of a structure to be removed, the aspect ratio is best understood by the examiner as the ratio of width to length as known in the art (please see prior art of record for evidence of this basis). The structures/layers to be removed in Van Buskirk (layers 34 and 32) and in Choi (layers 67) are clearly seen (fig. 1D of Van Buskirk and fig. 3D of Choi) having the width of greater than twice the thickness/length of the layers, thus, layers 34 and 32 in Van Buskirk and layer 67 in Choi are interpreted by the examiner as layers/structures to be removed having an aspect ratio of greater than 2.

Therefore, the examiner asserts that either Van Buskirk or Choi discloses the step of "providing a substrate having the structures to be removed on the substrate, the structure to be removed having an aspect ratio of greater than 2" as required in claim 1.

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lan Vinh whose telephone number is 571 272 1471. The examiner can normally be reached on M-F 8:30-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571 272 1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



LV
April 2, 2004